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ANDREWS & KURTH, L.L.P.
600 TRAVIS, SUITE 4200
HOUSTON, TX 77002

EXAMINER	
HUGHES, SCOTT A	
ART UNIT	**PAPER NUMBER**
3663	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/26/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/710,513	VARSAMIS ET AL.	
	Examiner	Art Unit	
	Scott A. Hughes	3663	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 08 November 2006.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 20-22,24-74 and 96-113 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 20-22,24-74 and 96-113 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 16 July 2004 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11/8/2006 has been entered.

Response to Arguments

Applicant's arguments with respect to claims 20-22, 24-74, and 96-113 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 22 and 24 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The amended claims contain limitations directed to pod data "defining a first state of said memory" or "a second state of said memory." The limitation directed to the first and second states of the memory is not described in the specification. It is unclear what is meant by the term "state of said memory" since this term does not have support in the specification. Applicant does not state where in the specification there is support for the limitation of "state of said memory device" as used in claims 22 and 24.

Claims 22 and 24 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

It is unclear what is meant by the term "state of said memory" as discussed regarding limitations to the pod data defining first and second states of memories of the devices as this term is described in the specification.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 22 and 24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The amended limitations in the claim regarding the "state of said memory" are unclear because it is not known what is meant by "state of said memory." Therefore, the scope of the claim cannot be determined and the limitation is indefinite.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 20-26, 35-51, 53-55, 57-59, 96-103, 105-16, 108-110, and 112-113 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zimmer (5157392) in view of Endo (6630890).

With regard to claim 20, Zimmer discloses a sensor array (Fig. 1). Zimmer discloses a plurality of sensor pods 15 (Column 3, Lines 5-45) each characterized by having a sensor 36,37 therein operatively coupled to a multi-bit memory 31, a processor 32 operatively coupled to the memory, and a first telemetric communications interface 30 operatively coupled to the memory (Fig. 1) (Column 4, Line 35 to Column 5, Line 11). Zimmer discloses a telemetry and control module 10 communicatively coupled to the first telemetric communications interface of the first of the plurality of sensor pods (Fig.1) (Column 3, Line 5 to Column 4, Line 45; Column 7, Line 15 to Column 8, Line 15). Zimmer discloses that each of the sensor pods sends its data upwards from its

own memory through the telemetry unit to the pods above until it reaches the telemetry control module in the top of the borehole (Column 3, Line 5 to Column 4, Line 45; Column 7, Line 15 to Column 8, Line 15). Zimmer does not disclose that this telemetric transmission is done by using first and second telemetric interfaces in the sensor pods. Zimmer only discloses a first telemetric interface in each device that sends the data upwards through higher devices to the main unit. Endo teaches multiple sensor pods used in a borehole that relay data to a surface control unit (Figs. 2-3) (abstract; Column 4, Line 30 to Column 6). Endo teaches that the sensor pods have first and second bi-directional telemetric communication interfaces (CMD, DATA) (Fig. 3) (Column 4, Line 30 to Column 6, Line 65). It would have been obvious to modify Zimmer to include first and second telemetric interfaces as taught by Endo in order to be able to send data and command signals from the shuttles to the tool cartridge and surface unit and from the tool cartridge and surface unit to the shuttles.

With regard to claim 21, Endo teaches that each of the plurality of sensor pods is arranged to simultaneously transfer first data from the memory to the first telemetric communications interface and second data from the second telemetric communications interface to the memory (Figs. 2-6) (abstract; Column 4, Line 30 to Column 6, Line 65; Column 7, Liner 28 to Column 8, Line 50). It would have been obvious to modify Zimmer to include simultaneously transferring the data as taught by Endo so that the data is continuously transmitted and the timing between pulses is not interrupted.

With regard to claims 22, as best understood by the examiner, Zimmer discloses first pod data defining a first state of the memory of the first of the plurality at a first point

in time, second pod data defining a first state of the memory of the second of the plurality at a first point in time, said first pod data defining a first state of a memory element in the telemetry and control module at a second point in time after the first point in time, and said second pod data defining a second state of the memory of the first of the plurality at a second point in time (Column 5, Line 54 to Column 8, Line 15).

With regard to claim 24, Zimmer discloses a second state of the memory element in the telemetry and control module defined by second pod data at a third point in time after the second point (Column 5, Line 54 to Column 8, Line 15).

With regard to claim 25, Zimmer discloses that the plurality includes the first of the plurality, a last of the plurality and at least one inner of the plurality, each of the at least one inner of the plurality has the first telemetric communications interface coupled to a first adjacent of the plurality and that the device is also coupled to a second adjacent of the plurality, the first telemetric communications interface of the last of the plurality is coupled to one of the at least one inner of the plurality, and the first telemetric communications interface of the first of the plurality is coupled to the telemetry and control module and the first of the plurality is coupled to the first telemetric communications interface of one of the at least one inner of the plurality (Fig. 1; abstract; Column 2, Lines 5-55; Column 6, Lines 1-33; Columns 7-8). Zimmer discloses M recording stations 15 (sensor pods) connected together by a telemetry cable 27. Each recording station has a first telemetric communications interface, and also has other telemetric communications means that allow for the connection of the telemetry cable and the transfer of data along the telemetry cable from one station to the next.

This is a first, inner, and last of a plurality of sensor pods. Zimmer does not disclose that this telemetric transmission is done by using first and second telemetric interfaces in the sensor pods. Zimmer only discloses a first telemetric interface in each device that sends the data upwards through higher devices to the main unit. Endo teaches multiple sensor pods used in a borehole that relay data to a surface control unit (Figs. 2-3) (abstract; Column 4, Line 30 to Column 6). Endo teaches that the sensor pods have first and second bi-directional telemetric communication interfaces (CMD, DATA) (Fig. 3) (Column 4, Line 30 to Column 6, Line 65). It would have been obvious to modify Zimmer to include first and second telemetric interfaces as taught by Endo in order to be able to send data and command signals from the shuttles to the tool cartridge and surface unit and from the tool cartridge and surface unit to the shuttles.

With regard to claim 35, Zimmer discloses that communication between the plurality of sensor pods uses a communications protocol, and communication between the telemetry and control module and the first of the plurality uses a communications protocol (Column 6, Column 7, Line 1 to Column 8, Line 50).

With regard to claim 36, Zimmer discloses that the communications protocol is a serial communications protocol (Column 6, Column 7, Line 1 to Column 8, Line 50).

With regard to claim 38, Zimmer discloses that each of the plurality further comprises, a clamping mechanism 28 arranged to releasably clamp the sensor pod to a borehole wall (Column 2, Lines 38-55; Column 4, Lines 35-45).

With regard to claim 39, Zimmer discloses that each of the plurality is further characterized by, the clamping mechanism being controlled by the sensor pod in

response to a signal received at the first telemetric communications interface (Column 2, Lines 38-55; Column 4, Lines 35-45; Column 6, Lines 1-53).

With regard to claim 40, Zimmer discloses that the signal originates from the telemetry and control module (Column 6, Lines 1-53). Zimmer discloses that the telemetry and control module provides a prompt signal, and that the device responds to this prompt signal to clamp and begin taking data.

With regard to claim 41, Zimmer does not disclose a surface controller coupled to the telemetry and control module, wherein the signal originates from the surface controller. Zimmer does disclose that the telemetry cable 16 goes from the telemetry control unit to surface equipment. Endo teaches using a surface controller 100 (Fig. 2) (Columns 4-5). It would have been obvious to have a surface controller coupled to the telemetry cable 16 to send the signals to the downhole equipment in order to have a central computer than can be used by an operator to control the downhole equipment and data transfer and make adjustments as needed.

With regard to claim 42, Zimmer discloses that the signal originates from an adjacent one of the plurality of sensor pods telemetric communications interface (Column 2, Lines 38-55; Column 4, Lines 35-45; Column 6, Lines 1-53). Zimmer does not disclose that the pods have second communication interfaces. Endo teaches sensor units with first and second interfaces, wherein the first interface of one unit is connected to the second interface of a second unit (CMD, DATA) (Fig. 3) (Columns 4-5). Zimmer discloses that the signals go from the first pod to the last pod (Fig. 1), and

therefore the signal would travel from one device to the telemetric communications interface of the next as taught by Endo.

With regard to claim 43, Zimmer discloses that each of the plurality further comprises, a processor 32 coupled to the memory 31, the first telemetric communications interface 30 and the second telemetric communications interface 33, as taught by Endo and discussed above, the processor arranged to interpret signals received at the first telemetric communications interface and control the sensor pod (Column 4, Line 45 to Column 6, Line 52).

With regard to claim 44, Zimmer discloses that the sensor is a seismic sensor 36, 37 (Column 4, Line 45 to Column 5, Line 5).

With regard to claim 45, Zimmer discloses a plurality of cables 27, wherein each of the plurality of sensor pods 15 has upper and lower ends and characterized by being arranged to be repeatably coupled and uncoupled to a first and second of the plurality of cables at both the upper and lower ends, and the plurality of sensor pods are removably coupled together upper end to lower end by the plurality of cables to form a string, with a first end of the string of sensor pods removably coupled to the telemetry and control module 10 with one 16 of the plurality of cables (Fig. 1) (Column 4, Lines 23-40; Column 7, Lines 15-40).

With regard to claim 46, Zimmer discloses that each of the plurality of sensor pods is characterized by, having a processor 32 arranged to communicate with the telemetry and control module 10 and with other sensor pods and designed to store an identification (Column 2, Lines 5-55; Column 4, Lines 1-44; Column 5, Lines 15-27).

Zimmer discloses that each processor contains information about the location of the station, and this is read as its identification since the location would correspond to the device in the data.

With regard to claim 47, Zimmer discloses that the telemetry and control module can query each of the plurality of sensor pods, and each of the plurality of sensor pods is arranged to answer a query (Column 4; Column 5, Lines 15-27, Column 6).

With regard to claim 48, Zimmer discloses that the telemetry and control module harmonizes with the plurality of sensor pods to establish a unique identification for each of the plurality of sensor pods, and the telemetry and control module registers the position in the string of each of the sensor pods relative to the plurality of sensor pods (Column 4, Lines 1-40; Column 5, Lines 15-27, Column 6). Zimmer discloses that each processor contains information about the location of the station, and this is read as its identification since the location would be interpreted by the control module 10 when taking data from each station.

With regard to claim 49, Zimmer discloses using a particular identification, the telemetry and control module queries a specific one of the plurality of sensor pods, and the specific one of the plurality of sensor pods answers the telemetry and control module (Column 5, Lines 15-27, Column 6).

With regard to claim 50, Zimmer discloses that the telemetry and control module queries about a status of a sensor (Column 2; Column 4; Column 5, Lines 15-27). Zimmer discloses that information about each sensor is part of the data, and that the

main telemetry unit interrogates the sensor stations 15 for their data. Therefore, the main telemetry and control module queries about the status of the sensors.

With regard to claim 51, Zimmer discloses that the telemetry and control module queries about a status of a memory (Column 2; Column 5, Lines 15-27).

With regard to claim 53, Zimmer discloses that the telemetry and control module queries about a status of a clamping mechanism (Column 2, Lines 15-55; Column 4; Column 6, Lines 34-62). Zimmer discloses that information about each clamping mechanism is part of the data, and that the main telemetry unit interrogates the sensor stations 15 for their data. Therefore, the main telemetry and control module queries about the status of the clamping mechanisms.

With regard to claim 54, Zimmer discloses that using a particular identification, the telemetry and control module commands a function of a specific one of the plurality of sensor pods, and the specific one of the plurality of sensor pods performs the function (Column 2; Column 5, Lines 15-27).

With regard to claim 55, Zimmer discloses that the telemetry and control module commands to manipulate a clamping mechanism (Column 2, Column 4; Column 6, Lines 34-62).

With regard to claim 57, Zimmer discloses that the telemetry and control module sends commands to control a sensor (Column 2, Lines 15-26; Column 4; Column 5, Lines 15-27).

With regard to claim 58, Zimmer discloses that the telemetry and control module simultaneously commands each of the plurality of sensor pods to record data (Column 5, Lines 15-27; Column 7, Line 15 to Column 8, Line 15).

With regard to claim 59, Zimmer discloses that the telemetry and control module nearly simultaneously commands each of the plurality of sensor pods to transmit data (Column 5, Lines 15-27; Column 7, Line 15 to Column 8, Line 15).

With regard to claim 60, Zimmer does not disclose a main controller coupled to the telemetry and control module 10. Zimmer discloses that the telemetry and control module 10 is connected to surface equipment through wire 16, but does not disclose the specifics of the surface equipment. Endo discloses a telemetry and control module 150 connected to a plurality of sensor pods 160 in a borehole similar to the system of Zimmer (Fig. 2). Endo discloses a main controller 100 on the surface to control the system (Column 3, Lines 30-60; Column 4; Column 7 Line 28 to Column 8). It would have been obvious to modify Zimmer to include a surface main controller as taught by Endo in order to be able to synchronize the system to a terminal that can be used by an operator and to provide a main operations unit which an operator can use to send signals to downhole components of the system.

With regard to claim 61, Zimmer discloses that each of the plurality of sensor pods is characterized by, having a processor 32 arranged to communicate with the telemetry and control module and with other sensor pods and to store an identification (Column 2; Column 4, Lines 1-44; Column 5, Lines 15-27). Zimmer does not disclose that the communication is with a main controller, but instead that it is with the main

telemetry and control module. Endo discloses a telemetry and control module 150 connected to a plurality of sensor pods 160 in a borehole similar to the system of Zimmer (Fig. 2). Endo discloses a main controller 100 on the surface to control the system (Column 3, Lines 30-60; Column 4; Column 7 Line 28 to Column 8). It would have been obvious to modify Zimmer to include a surface main controller as taught by Endo in order to be able to synchronize the system to a terminal that can be used by an operator and to provide a main operations unit which an operator can use to send signals to downhole components of the system.

With regard to claim 62, Zimmer discloses that the telemetry and control module is arranged to query each of the plurality of sensor pods, and each of the plurality of sensor pods is arranged to answer a query (Column 4; Column 5, Lines 15-27; Column 6). Zimmer does not disclose that the communication is with a main controller, but instead that it is with the main telemetry and control module. Endo discloses a telemetry and control module 150 connected to a plurality of sensor pods 160 in a borehole similar to the system of Zimmer (Fig. 2). Endo discloses a main controller 100 on the surface to control the system (Column 3, Lines 30-60; Column 4; Column 7 Line 28 to Column 8). It would have been obvious to modify Zimmer to include a surface main controller as taught by Endo in order to be able to synchronize the system to a terminal that can be used by an operator and to provide a main operations unit which an operator can use to send signals to downhole components of the system.

With regard to claim 63, Zimmer discloses that the telemetry and control module is arranged to harmonize with the plurality of sensor pods to establish a unique

identification for each of the plurality of sensor pods, and the telemetry and control module is arranged to register the position in the string of each of the sensor pods relative to the plurality of sensor pods (Column 4, Lines 1-40; Column 5, Lines 15-27; Column 6). Zimmer does not disclose that the communication is with a main controller, but instead that it is with the main telemetry and control module. Endo discloses a telemetry and control module 150 connected to a plurality of sensor pods 160 in a borehole similar to the system of Zimmer (Fig. 2). Endo discloses a main controller 100 on the surface to control the system (Column 3, Lines 30-60; Column 4; Column 7 Line 28 to Column 8). It would have been obvious to modify Zimmer to include a surface main controller as taught by Endo in order to be able to synchronize the system to a terminal that can be used by an operator and to provide a main operations unit which an operator can use to send signals to downhole components of the system.

With regard to claim 64, Zimmer discloses that using a particular identification, the telemetry and control module is arranged to query a specific one of the plurality of sensor pods, and the specific one of the plurality of sensor pods is arranged to answer the telemetry and control module computer (Column 5, Lines 15-27; Column 6). Zimmer does not disclose that the communication is with a main controller, but instead that it is with the main telemetry and control module. Endo discloses a telemetry and control module 150 connected to a plurality of sensor pods 160 in a borehole similar to the system of Zimmer (Fig. 2). Endo discloses a main controller 100 on the surface to control the system (Column 3, Lines 30-60; Column 4; Column 7 Line 28 to Column 8). It would have been obvious to modify Zimmer to include a surface main controller as

taught by Endo in order to be able to synchronize the system to a terminal that can be used by an operator and to provide a main operations unit which an operator can use to send signals to downhole components of the system.

With regard to claim 65, Zimmer discloses that the telemetry and control module queries about a status of a sensor (Column 2, Lines 15-26; Column 4). Zimmer discloses that information about each sensor is part of the data, and that the main telemetry unit interrogates the sensor stations 15 for their data. Therefore, the main telemetry and control module queries about the status of the sensors. Zimmer does not disclose that the communication is with a main controller, but instead that it is with the main telemetry and control module. Endo discloses a telemetry and control module 150 connected to a plurality of sensor pods 160 in a borehole similar to the system of Zimmer (Fig. 2). Endo discloses a main controller 100 on the surface to control the system (Column 3, Lines 30-60; Column 4; Column 7 Line 28 to Column 8). It would have been obvious to modify Zimmer to include a surface main controller as taught by Endo in order to be able to synchronize the system to a terminal that can be used by an operator and to provide a main operations unit which an operator can use to send signals to downhole components of the system.

With regard to claim 66, Zimmer discloses that the telemetry and control module queries about a status of a memory (Column 2, Lines 15-26). Zimmer does not disclose that the communication is with a main controller, but instead that it is with the main telemetry and control module. Endo discloses a telemetry and control module 150 connected to a plurality of sensor pods 160 in a borehole similar to the system of

Zimmer (Fig. 2). Endo discloses a main controller 100 on the surface to control the system (Column 3, Lines 30-60; Column 4; Column 7 Line 28 to Column 8). It would have been obvious to modify Zimmer to include a surface main controller as taught by Endo in order to be able to synchronize the system to a terminal that can be used by an operator and to provide a main operations unit which an operator can use to send signals to downhole components of the system.

With regard to claim 68, Zimmer discloses that the telemetry and control module queries about a status of a clamping mechanism (Column 2, Lines 15-55; Column 4; Column 6, Lines 34-62). Zimmer discloses that information about each clamping mechanism is part of the data, and that the main telemetry unit interrogates the sensor stations 15 for their data. Therefore, the main telemetry and control module queries about the status of the clamping mechanisms. Zimmer does not disclose that the communication is with a main controller, but instead that it is with the main telemetry and control module. Endo discloses a telemetry and control module 150 connected to a plurality of sensor pods 160 in a borehole similar to the system of Zimmer (Fig. 2). Endo discloses a main controller 100 on the surface to control the system (Column 3, Lines 30-60; Column 4; Column 7 Line 28 to Column 8). It would have been obvious to modify Zimmer to include a surface main controller as taught by Endo in order to be able to synchronize the system to a terminal that can be used by an operator and to provide a main operations unit which an operator can use to send signals to downhole components of the system.

With regard to claim 69, Zimmer discloses that using a particular identification, the telemetry and control module commands a function of a specific one of the plurality of sensor pods, and the specific one of the plurality of sensor pods performs the function (Column 2; Column 5, Lines 15-27). Zimmer does not disclose that the communication is with a main controller, but instead that it is with the main telemetry and control module. Endo discloses a telemetry and control module 150 connected to a plurality of sensor pods 160 in a borehole similar to the system of Zimmer (Fig. 2). Endo discloses a main controller 100 on the surface to control the system (Column 3, Lines 30-60; Column 4; Column 7 Line 28 to Column 8). It would have been obvious to modify Zimmer to include a surface main controller as taught by Endo in order to be able to synchronize the system to a terminal that can be used by an operator and to provide a main operations unit which an operator can use to send signals to downhole components of the system.

With regard to claim 70, Zimmer discloses that the telemetry and control module commands to manipulate a clamping mechanism of a specific one of the pods (Column 2, Column 4; Column 6, Lines 34-62). Zimmer does not disclose that the communication is with a main controller, but instead that it is with the main telemetry and control module. Endo discloses a telemetry and control module 150 connected to a plurality of sensor pods 160 in a borehole similar to the system of Zimmer (Fig. 2). Endo discloses a main controller 100 on the surface to control the system (Column 3, Lines 30-60; Column 4; Column 7 Line 28 to Column 8). It would have been obvious to modify Zimmer to include a surface main controller as taught by Endo in order to be able to

synchronize the system to a terminal that can be used by an operator and to provide a main operations unit which an operator can use to send signals to downhole components of the system.

With regard to claim 72, Zimmer discloses that the telemetry and control module sends commands to control a sensor of a specific one of the pods (Column 2, Lines 15-26; Column 4; Column 5, Lines 15-27). Zimmer does not disclose that the communication is with a main controller, but instead that it is with the main telemetry and control module. Endo discloses a telemetry and control module 150 connected to a plurality of sensor pods 160 in a borehole similar to the system of Zimmer (Fig. 2). Endo discloses a main controller 100 on the surface to control the system (Column 3, Lines 30-60; Column 4; Column 7 Line 28 to Column 8). It would have been obvious to modify Zimmer to include a surface main controller as taught by Endo in order to be able to synchronize the system to a terminal that can be used by an operator and to provide a main operations unit which an operator can use to send signals to downhole components of the system.

With regard to claim 73, Zimmer discloses that the telemetry and control module simultaneously commands each of the plurality of sensor pods to record data (Column 5, Lines 15-27; Column 7, Line 15 to Column 8, Line 15). Zimmer does not disclose that the communication is with a main controller, but instead that it is with the main telemetry and control module. Endo discloses a telemetry and control module 150 connected to a plurality of sensor pods 160 in a borehole similar to the system of Zimmer (Fig. 2). Endo discloses a main controller 100 on the surface to control the

system (Column 3, Lines 30-60; Column 4; Column 7 Line 28 to Column 8). It would have been obvious to modify Zimmer to include a surface main controller as taught by Endo in order to be able to synchronize the system to a terminal that can be used by an operator and to provide a main operations unit which an operator can use to send signals to downhole components of the system.

With regard to claim 74, Zimmer discloses that the telemetry and control module nearly simultaneously commands each of the plurality of sensor pods to transmit data (Column 5, Lines 15-27; Column 7, Line 15 to Column 8, Line 15). Zimmer does not disclose that the communication is with a main controller, but instead that it is with the main telemetry and control module. Endo discloses a telemetry and control module 150 connected to a plurality of sensor pods 160 in a borehole similar to the system of Zimmer (Fig. 2). Endo discloses a main controller 100 on the surface to control the system (Column 3, Lines 30-60; Column 4; Column 7 Line 28 to Column 8). It would have been obvious to modify Zimmer to include a surface main controller as taught by Endo in order to be able to synchronize the system to a terminal that can be used by an operator and to provide a main operations unit which an operator can use to send signals to downhole components of the system.

Claims 26 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zimmer in view of Endo as applied to claims 20-22 and 24-25, and further in view of Besson (6462672).

With regard to claim 26, Zimmer discloses that last pod data is produced by the seismic sensor of the last of the plurality and transferred to the memory of the last of the plurality, the last pod data is transferred from the memory of the last of the plurality to the telemetry and control module via each of the at least one inner of the plurality, and via the first of the plurality (Fig. 1; abstract; Column 2, Lines 5-55; Column 6, Lines 1-33; Columns 7-8). Zimmer discloses M recording stations 15 (sensor pods) connected together by a telemetry cable 27. Each recording station has a first and second telemetric communications interface, and also has other telemetric communications means that allow for the connection of the telemetry cable and the transfer of data along the telemetry cable from one station to the next as taught by Endo. Zimmer does not disclose that the data is temporarily stored in the memory of each of the inner pods of the plurality nor that the data is temporarily stored in the memory of the first of the plurality before being sent to the telemetry and control module 10. Besson teaches that data received in sensor pods located in a borehole can be temporarily stored in the memory of each of the sensor pods as it is passed along the to the first of the sensor pods (Fig. 1) (abstract; Column 2, Lines 50-65; Column 4, Line 1 to Column 5, Line 2). It would have been obvious to modify Zimmer to include temporarily storing the pod data in the memory of the each pod and in the memory of the first of the pods as taught by Besson in order to transmit data from a device far down in a borehole to the surface without losing the information of the signal over the distance of telemetry.

With regard to claim 37, Zimmer does not teach repeaters. Besson teaches repeaters 60 coupled between pods arranged to increase communication range

between the two of a plurality of sensor pods (abstract, Column 3, Lines 60-67). It would have been obvious to modify Zimmer to include repeaters as taught by Besson in order to ensure that each device is within communication range of its nearest neighbor.

Claims 27-34 and 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zimmer in view of Endo as applied to claim 20 and 54 above, and further in view of Laborde.

With regard to claim 27, Zimmer does not disclose that each of the plurality is further characterized by a communications bypass coupled between the first telemetric communications interface and the second telemetric communications interface, the communications bypass having a switch element having a first state, which enables the bypass, and a second state which disables the bypass. Laborde discloses bypass switches in nodes between first and second telemetric communications interfaces (Fig. 4) (Column 4, Line 40 to Column 5, Line 5; Column 6). It would have been obvious to modify Zimmer to include bypass switches as taught by Laborde in order to be able to bypass a device whose communication channels have failed so that data can still be transferred to the surface.

With regard to claim 28, Laborde discloses that each of the plurality is further characterized by the switch element being controlled by the sensor pod in response to a signal received at the first telemetric communications interface (Column 4, Line 40 to Column 6, Line 57).

With regard to claim 29, Laborde discloses that the signal originates from a telemetry and control module 37,362 (Column 5).

With regard to claim 30, Laborde discloses a surface controller coupled to the telemetry and control module, wherein the signal originates from the surface controller 300 (Columns 5-6). It would have been obvious to modify Zimmer to include the surface controller coupled to the telemetry and control module as taught by Laborde in order to control operations of switch elements to bypass devices that have failed.

With regard to claim 31, Laborde discloses that the signal originates from the second telemetric communications interface of an adjacent one of the plurality of sensor pods (Column 4, Line 40 to Column 6). Laborde discloses that the devices monitor the channels of the devices above and below them, and can send a signal to operate the switches based on this monitoring. The monitoring would be done through the second telemetric communications interface of the device for the device above it.

With regard to claim 32, Laborde discloses that the switch elements of each of the plurality are in the first state, and each of a plurality of pods nearly simultaneously receives the signal at the first telemetric communications interface from the telemetry and control module (Column 5, Line 5 to Column 6, Line 48).

With regard to claim 33, Laborde discloses a surface controller 300 coupled to the telemetry and control module, wherein the switch elements of each of the plurality are in the first state, and each of the plurality of the pods nearly simultaneously receives the signal at the first telemetric communications interface from the surface controller (Column 5, Line 5 to Column 6, Line 48).

With regard to claim 34, Laborde discloses switch elements operated by a signal from a telemetry and control module. It would have been obvious to modify Zimmer to include the surface controller coupled to the telemetry and control module as taught by Laborde in order to control operations of switch elements to bypass devices that have failed. Zimmer discloses a plurality of sensors that measure data and transfer the data to the memory of each of the sensor pods upon receipt of a signal from the telemetry and control device (Column 2, Lines 5-55; Column 7, Line 1 to Column 8, Line 50). It would have been obvious to modify Zimmer to include the signal to operate switches with as taught by Laborde with the signal to measure data in order to measure data with the sensor pods and transfer this data along the devices which have been determined to be in working condition (do not a communication channel failure) so that data is not lost by a failed station.

With regard to claim 56, Zimmer does not disclose that the telemetry and control module commands to manipulate a switch element. Laborde discloses bypass switches in nodes between first and second telemetric communications interfaces (Fig. 4) (Column 4, Line 40 to Column 5, Line 5). Laborde discloses commands from a control module that manipulate the switches (Columns 5-6). It would have been obvious to modify Zimmer to include switches and commands to manipulate switches as taught by Laborde in order to be able to bypass a device whose communication channels have failed so that data can still be transferred to the surface.

Claim 52 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zimmer in view of Endo as applied to claim 49 above, and further in view of Tubel (5730219).

With regard to claim 52, Zimmer does not disclose that the telemetry and control module queries about a voltage level. Zimmer discloses that the telemetry and control module communicates with the sensor pods, but does not specify that voltage is enquired about (Column 2, Lines 5-55; Column 5, Lines 15-27; Column 6). Zimmer discloses that the voltage is monitored in borehole telemetry systems (Column 12). It would have been obvious to modify Zimmer to query about the voltage level as taught by Tubel in order to make sure that the signals are transmitted at the appropriate voltages.

Claim 71 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zimmer in view of Endo as applied to claim 69 above, and further in view of Laborde.

With regard to claim 71, Zimmer does not disclose that the telemetry and control module commands to manipulate a switch element. Laborde discloses bypass switches in nodes between first and second telemetric communications interfaces (Fig. 4) (Column 4, Line 40 to Column 5, Line 5). Laborde discloses commands from a control module that manipulate the switches (Columns 5-6). It would have been obvious to modify Zimmer to include switches and commands to manipulate switches as taught by Laborde in order to be able to bypass a device whose communication channels have failed so that data can still be transferred to the surface. Zimmer does not disclose that the communication is with a main controller, but instead that it is with the main telemetry

and control module. Endo discloses a telemetry and control module 150 connected to a plurality of sensor pods 160 in a borehole similar to the system of Zimmer (Fig. 2). Endo discloses a main controller 100 on the surface to control the system (Column 3, Lines 30-60; Column 4; Column 7 Line 28 to Column 8). It would have been obvious to modify Zimmer to include a surface main controller as taught by Endo in order to be able to synchronize the system to a terminal that can be used by an operator and to provide a main operations unit which an operator can use to send signals to downhole components of the system.

Claim 67 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zimmer in view of Endo as applied to claim 64 above, and further in view of Tubel (5730219).

With regard to claim 71, Zimmer does not disclose that the telemetry and control module queries about a voltage level. Zimmer discloses that the telemetry and control module communicates with the sensor pods, but does not specify that voltage is enquired about (Column 2, Lines 5-55; Column 5, Lines 15-27; Column 6). Zimmer discloses that the voltage is monitored in borehole telemetry systems (Column 12). It would have been obvious to modify Zimmer to query about the voltage level as taught by Tubel in order to make sure that the signals are transmitted at the appropriate voltages. Zimmer does not disclose that the communication is with a main controller, but instead that it is with the main telemetry and control module. Endo discloses a telemetry and control module 150 connected to a plurality of sensor pods 160 in a borehole similar to the system of Zimmer (Fig. 2). Endo discloses a main controller 100

on the surface to control the system (Column 3, Lines 30-60; Column 4; Column 7 Line 28 to Column 8). It would have been obvious to modify Zimmer to include a surface main controller as taught by Endo in order to be able to synchronize the system to a terminal that can be used by an operator and to provide a main operations unit which an operator can use to send signals to downhole components of the system.

Claims 96-113 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zimmer in view of Besson (6462672).

With regard to claim 96, Zimmer discloses a sensor array for conducting a downhole survey (Fig. 1). Zimmer discloses a string of intelligent sensor pods 15 (Fig. 1) each sensor pod including a sensor 36,37 and a multi-bit memory 31 (Column 4, Line 45 to Column 5, Line 11). Zimmer discloses a telemetry and control module 10 operatively connected to a first end of the string (Fig. 1) (Column 3, Lines 5-45). Zimmer discloses means for collecting data with the sensors (Column 4, Line 45 to Column 5, Line 11). Zimmer discloses means for storing the data in the memory (Column 4, Line 45-68; Column 5, Line 15 to Column 6, Line 35). Zimmer discloses means for transmitting the data from the memory to the telemetry and control module (Column 7, Line 15 to Column 8, Line 50). Zimmer does not disclose that the transmitting is done in a bucket brigade transfer, where a bucket brigade transfer is defined by each sensor pod transmitting data stored in the memory of the sensor pod to a memory of an adjacent device in the string of intelligent sensor pods in a first direction and concurrently receiving data, if any, from a memory of an adjacent device in the

string of sensor pods in a second direction opposite the first direction, if any, and storing the received data in the memory of the sensor pod. Zimmer does not disclose that the control module can send data to the memory of the pods. Besson teaches sensors in a borehole that communicate data and command signals between a control unit 34 and the sensor devices in the borehole (Column 3, Line 19 to Column 5, Line 2). Besson teaches means for transmitting and receiving data concurrently in two directions by a bucket brigade transfer of data (Column 4, Line 26 to Column 5, Line 2). It would have been obvious to modify Zimmer to include the bucket brigade transfer of data and command signals between the sensor pods and control module as taught by Besson in order to transmit data from a device far down in a borehole to the surface without losing the information of the signal over the distance of telemetry.

With regard to claim 97, Zimmer discloses that the survey is a seismic survey and that the data are seismic data (abstract).

With regard to claim 98, Besson teaches means for simultaneously transferring and receiving data by one of the sensor pods (abstract; Column 2, Lines 50-65; Column 3, Line 19 to Column 5, Line 2). It would have been obvious to modify Zimmer to include simultaneously transferring and receiving the data as taught by Besson in order to relay data continuously as it is taken by the sensors.

With regard to claim 99, Zimmer discloses means for transmitting and receiving of data between devices sequentially by a one of the sensor pods (Column 7, Line 15 to Column 8, Line 15).

With regard to claim 100, Zimmer discloses means for arming each sensor pod within the string to receive a simultaneous trigger signal by enabling a direct communications path along a common conductor to each sensor pod within the string (Column 7, Line 40-63).

With regard to claim 101, Zimmer discloses means for powering the string of sensor pods via the common conductor (Column 3, Lines 5-26) (Fig. 1).

With regard to claim 102, Zimmer discloses means for simultaneously triggering each sensor pod within the string of intelligent pods to begin recording data (Column 6, Lines 1-9).

With regard to claim 103, Zimmer discloses that the triggering is caused by a signal transmitted by the telemetry and control module (computer 26 in control module 10) along the conductor (Column 6, Lines 1-9).

With regard to claim 104, Zimmer does not disclose a surface controller coupled to the telemetry and control module 10. Zimmer discloses that the telemetry and control module 10 is connected to surface equipment through wire 16, but does not disclose the specifics of the surface equipment. Besson teaches a telemetry and control module 34 connected to a plurality of sensor pods 22,24,26,28,30,32 in a borehole similar to the system of Zimmer (Fig. 1). Besson teaches a main controller 36 on the surface to control the system (Column 3, Line 18 to Column 5, Line 2). It would have been obvious to modify Zimmer to include a surface main controller as taught by Besson in order to be able to have a surface unit from which to process the data obtained by the sensor and send commands to control the sensors acquiring data.

With regard to claim 105, Zimmer discloses means for simultaneously triggering the sensor pods to begin bucket brigade transfer, as taught by Besson (Column 6, Lines 1-9; Columns 7-8) and means for disabling the direct communications path after the triggering, forcing communications along the string to flow through the memory of the sensor pods (Column 8, Lines 1-50).

With regard to claim 106, Zimmer discloses that the triggering is caused by a signal transmitted by the telemetry and control module (computer 26 in control module 10) along the conductor (Column 6, Lines 1-9, Columns 7-8).

With regard to claim 107, Zimmer does not disclose a surface controller coupled to the telemetry and control module 10. Zimmer discloses that the telemetry and control module 10 is connected to surface equipment through wire 16, but does not disclose the specifics of the surface equipment. Besson teaches a telemetry and control module 34 connected to a plurality of sensor pods 22,24,26,28,30,32 in a borehole similar to the system of Zimmer (Fig. 1). Besson teaches a main controller 36 on the surface to control the system (Column 3, Line 18 to Column 5, Line 2). It would have been obvious to modify Zimmer to include a surface main controller as taught by Besson in order to be able to have a surface unit from which to process the data obtained by the sensor and send commands to control the sensors acquiring data.

With regard to claim 108, Zimmer discloses means for disconnecting the telemetry and control module from the string of pods and means for disassembling the string of pods (Column 4, Column 10, Lines 1-30).

With regard to claim 109, Zimmer discloses means for automatically determining the composition and characteristics of the string by querying the sensor pods (Column 5, Lines 15-30; Column 6, Lines 34-54).

With regard to claim 110, Zimmer discloses means for selectively clamping the sensor pods to the wall of the borehole 28,39, means for selectively unclamping the sensor pods, 28,39, and means for controlling the selective clamping and unclamping with the telemetry and control module (Column 4, Lines 20-45; Column 6, Lines 34-53).

With regard to claim 111, Zimmer discloses means for selectively clamping and unclamping the sensor pods from the borehole wall 28,39 and also means for controlling the clamping and unclamping (Column 4, Lines 20-45; Column 6, Lines 34-53). Zimmer does not disclose that the control signal is sent from a surface controller coupled to the telemetry and control module. Zimmer discloses that the telemetry and control module 10 is connected to surface equipment through wire 16, but does not disclose the specifics of the surface equipment. Besson teaches a telemetry and control module 34 connected to a plurality of sensor pods 22,24,26,28,30,32 in a borehole similar to the system of Zimmer (Fig. 1). Besson teaches a main controller 36 on the surface to control the system (Column 3, Line 18 to Column 5, Line 2). It would have been obvious to modify Zimmer to include a surface main controller as taught by Besson in order to be able to have a surface unit from which to process the data obtained by the sensor and send commands to control the sensors acquiring data.

With regard to claim 112, Zimmer does not teach repeaters. Besson teaches repeaters 60 coupled between pods arranged to increase communication range

between the two of a plurality of sensor pods (abstract, Column 3, Lines 60-67). It would have been obvious to modify Zimmer to include repeaters as taught by Besson in order to ensure that each device is within communication range of its nearest neighbor.

With regard to claim 113, Zimmer discloses a sensor array (Fig. 1). Zimmer discloses a first sensor pod 15 having a multi-bit first memory 31 and a first sensor 36,37 disposed therein, the first sensor in communication with the first memory (Column 3, Lines 5-45; Column 4, Line 45 to Column 5, Line 11). Zimmer discloses a second sensor pod (Zimmer discloses a string of pods, and shows a second pod 15 below the first pod in Fig. 1) having a multi-bit second memory and a second sensor disposed therein, said second sensor pod connected to the first sensor pod by a first cable segment 27, with the second sensor being in communication with the second memory (Fig. 1) (Column 2, Lines 30-35; Column 3, Lines 5-45; Column 4, Line 45 to Column 5, Line 11). Zimmer discloses a third sensor pod (Zimmer discloses using a string of M sensor pods, with a typical number being 25 sensor pods). Zimmer discloses the third pod having a multi-bit third memory and a third sensor disposed therein, said third sensor pod connected to the second sensor pod by a second cable segment 27, with the third sensor being in communication with the third memory (Fig. 1) (Column 2, Lines 30-35; Column 3, Lines 5-45; Column 4, Line 45 to Column 5, Line 11). The second and third sensor pod have a memory and sensors that are the same as those disclosed in the representative first pod as Zimmer discloses that all the sensor units are identical. Zimmer does not disclose that the memory of the first and second pods are in bi-directional communication, nor that the memory of the second and third pods are in bi-

directional communication. Zimmer does not disclose that the data contents of the second memory is transferred to the first memory and data contents of third memory is transferred to the second memory in a bucket brigade fashion. Besson teaches borehole sensor pods 22,24,26,28,30 controlled by a control module that transmit data from the sensors in the pods to the surface through telemetry (abstract; Fig. 1). Besson teaches that the memory of each of the sensor pods is in bi-directional communication with the memory of the adjacent pods (abstract; Column 2, Lines 50-65; Column 4, Line 1 to Column 5, Line 2). Besson teaches that the data contents of the memories are transferred up from one sensor unit to the next (third to second, second to first) on to the surface unit (Column 4, Line 27 to Column 5, Line 2). It would have been obvious to modify Zimmer to include bi-directional communication as taught by Besson in order to be able to send data up to a recording module and to send commands from a master unit down to the sensor pods. It would have been obvious to modify Zimmer to include the bucket brigade transfer of data and command signals between the sensor pods and control module as taught by Besson in order to transmit data from a device far down in a borehole to the surface without losing the information of the signal over the distance of telemetry.

The statements related to the data contents of the memories and how these data are transferred are essentially method limitations. Thus, these claims as well as other statements of intended use do not serve to patentably distinguish the claimed structure over that of the reference. See <u>In re Pearson</u>, 181 USPQ 641; <u>In re Yanush</u>, 177 USPQ

705; In re Finsterwalder, 168 USPQ 530; In re Casey, 512 USPQ 235; In re Otto, 136 USPQ 458; Ex parte Masham, 2 USPQ 2nd 1647.

See MPEP § 2114 which states:

A claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from the prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ 2nd 1647

Claims directed to apparatus must be distinguished from the prior art in terms of structure rather than functions. In re Danly, 120 USPQ 528, 531.

Apparatus claims cover what a device is not what a device does. Hewlett-Packard Co. v. Bausch & Lomb Inc., 15 USPQ2d 1525, 1528.

As set forth in MPEP § 2115, a recitation in a claim to the material or article worked upon does not serve to limit an apparatus claim.

Conclusion

The cited prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Scott A. Hughes whose telephone number is 571-272-6983. The examiner can normally be reached on M-F 9:00am to 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on (571) 272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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SAH

JACK KEITH
SUPERVISORY PATENT EXAMINER